N° 5533 A.D. 1903

Date of Application, 10th Mar., 1903

Complete Specification Left, 9th Dec., 1903—Accepted, 21st Jan., 1904

PROVISIONAL SPECIFICATION.

Apparatus for Washing and Cleansing Air or Smoke, also for General Ventilating Purposes, and for Disinfecting or Perfuming.

THOMAS GREEN 10 Hunters Road Aston Manor Birmingham do hereby declare the nature of this invention to be as follows:—

The apparatus consists of a metal, wooden, or earthenware chamber, circular in form, and contains a combined water motor and fan, which is driven by water from the ordinary street mains, or from a storage tank. The air or smoke is rapidly sucked down from the inlet, and is passed through the water spray and over the water seal, to the outlet. All impurities, or solid matter, in the air, or smoke, are caught by the water spray, and dropped into the waste water pan, from which they are taken away by the overflow pipe provided to take away the waste water.

For disinfecting or perfuming an absorbent screen of worsted, or similar material, is fitted over the inlet or outlet of the apparatus, and saturated with a liquid disinfectant or perfume, and the air passing through same is impregnated with it, and delivered with great rapidity at the outlet.

Dated this 9th day of March 1903.

THOMAS GREEN.

COMPLETE SPECIFICATION.

"Apparatus for Washing and Cleansing Air or Smoke also for General Ventilating Purposes and for Disinfecting or Perfuming."

I, THOMAS GREEN, of 10, Hunters Road, Aston Manor, in the County of Warwick, Ventilating Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention is an apparatus for washing and cleansing air or smoke, also for general ventilating purposes, and for disinfecting or perfuming, and is designed for use in connection with the ventilating and cleansing of public and private buildings, hospitals, factories, workshops, and the like places where the ventilation of the air and the extraction therefrom of particles injurious to health is desirable. In the case of hospitals, theatres, and other buildings, I am enabled by my apparatus to disinfect or perfume at will, at the same

time as the atmosphere is cleansed, and this can be done very simply, and without the use of any additional mechanism. The apparatus is also applicable to the cleansing and washing of smoke, and is also of considerable utility in the extraction of air-laden particles of gritty matter, as in the case of workshops, where polishing and grinding operations are being carried on. The application of my invention to the latter uses will be further shown and described in the drawings annexed to the specification. The apparatus in each case is simply and cheaply made and applied and renders possible the ventilation and cleansing and also the perfuming of the atmosphere at a very small cost as compared with that of existing methods.

The apparatus consists essentially of a circular metal or other chamber having an inlet at its top for foul air to be sucked through, an outlet at one of its sides for the cleansed and cooled air to pass through, and a waste water outer tank encircling the aforesaid chamber constituting a seal for the air in its transit to impinge on and absorb and hold all solid and injurious particles in same. This outer pan is provided with a waste outlet for the water to escape and is provided with suitable standards or supports for holding the aforesaid inner chamber within it. Taking up a position horizontally within the inner chamber and supported by means of suitable bearings is a combined fan and water wheel or turbine provided in its outer circumference with pockets placed at a suitable angle thereon. This horizontally-disposed fan and turbine is driven by water jets terminating in suitable nozzles introduced into the chamber at certain intervals round its sides, the pressure of water coming either from the service pipes or from a storage tank. As a rule however the utilisation of the service water will be found quite sufficient for the purpose for which the apparatus is designed, the water wheel or turbine only being a light weight and having nothing whatever to impel round except its own weight. The number of jets used is of course in accordance with the size and capacity of the machine, but in an ordinary case two or three of these jets will be found sufficient for driving the turbine. The water impinging upon the pockets of the fan and turbine as it is driven round casts a fine spray round the wheel, and the foul air is drawn down on top of this wheel, through the inlet passage, sucked through and round same, and down into the water seal, from whence the current and suction takes it through the outlet passage up a discharge pipe, when it escapes into the atmosphere through a grid or perforated plate. This grid or perforated plate may have an outer perforated cover containing disinfecting or perfuming matter; the said cover being clamped or otherwise fixed on to its perforated grid or plate. Or the perfuming or disinfecting matter may, if desired, be placed in the outer waste water pan of the apparatus from whence it is sucked through into the atmosphere with the cooled and purified air. The apparatus may, and this would be desirable in the case of large installations, be made to use its own water by means of pumps, storage tanks, purifiers, and similar contrivances.

In the accompanying sheets of drawings Fig. 1 is a side view of my invention partly in section, Fig. 2 is a separate view of the turbine or water wheel showing the position and construction of the pockets, and Fig. 3 is a plan looking down upon the apparatus with the top removed. Fig. 4 shows the application of the apparatus in connection with the outlet pipe from a furnace where it is cleansing and washing the smoke, and Figs. 5, 6 & 7 show the application of the apparatus in a workshop to the benches of polishing bobs where it is sucking the dust-laden air out of the workshop, cleansing it, and discharging the purified air either into the atmosphere or back again to the workshop.

The apparatus consists of an open-bottomed container a, preferably circular in section, and built up of metal, earthenware, or other suitable material provided with a vertically-disposed inlet passage a^2 at its top, and a horizontally-disposed outlet passage a^3 leading into a discharge pipe a^4, provided with a grid

or perforated plate a^5 and a clamped-on perforated cover a^6. This circular chamber a takes into an outer pan b and is fixed there by means of supports or standards b^2 by soldering or any other method of attachment, the said outer pan b having an outlet pipe b^3 for the waste water to flow from. Fixed horizontally within the chamber a by means of suitable bearings c^2 is a combined fan and water wheel or turbine c provided with pockets c^3, the said fan and water wheel or turbine revolving on or with a shaft c^4 which is carried and supported by suitable arms c^5 fixed to the wall of the container. The bearing is preferably an anti-friction one, such as a ball bearing, so as to allow the turbine to revolve as freely as possible. Taking and screwing or otherwise attached to the walls of the chamber a are suitably disposed water jets d terminating in conical-shaped delivery nozzles d^2 directed on the pockets c^3 of the turbine. These water jets are shown in the drawing as three in number equidistant round the walls of the container, but a greater or less number than this may be used according to the size and capacity of the machine. To start operations the outer pan or container b is filled with water up beyond the bottom of the chamber a so as to constitute a water seal. The water jets are then turned on and the water coming through the nozzles d^2 impinges on the pockets c^3 of the fan and turbine c and drives same round at a rapid rate, sending off a water spray which is thrown off in all directions. This action causes the foul air to be sucked through the inlet passage a^2 down through the water spray and into the water seal where it deposits any solid matter or particles. The cleansed air is then sucked upwards by reason of the current emanating from the fan and turbine, through the outlet passage a^3 and up through the discharge pipe a^4, whence it passes through the perforated plate or grid a^5 into the atmosphere. Where it is desired to disinfect or perfume the air before it passes into the room a perforated cover a^6 is clamped on to the perforated plate a^5 and the disinfecting or perfuming matter placed in between as shown in Fig. 1. Or this cover may be dispensed with and the disinfecting or perfuming done by placing the disinfectant or perfumery in the outer pan b with the water whence it is sucked up with the purified air into the room. I may, if desired, dispense with the use of the outer pan or container b and use the chamber a only, providing it with a bottom and an overflow pipe.

In Fig. 4 a diagrammatic sketch shows the extended inlet pipe a^2 connecting up to the discharge flue e of a furnace, the smoke from the fire passing over the bridge as usual, but instead of passing up through the stack and into the atmosphere, taking a downward course through the apparatus where the smoke is cleansed and washed, the carbon particles being deposited in the outer pan b, and the cleansed air passing out into the atmosphere through the discharge pipe a^3. The action of the rapidly revolving turbine & fan c causes sufficient suction to draw the smoke rapidly through the apparatus and give a draught equal to the usual stack employed.

In Figs. 5, 6 & 7 the apparatus is shown cleansing a workshop from its dust-laden and particle-bearing atmosphere, the particular application being to a polishing or bobbing shop. In this case the foul inlet pipe a^2 is extended along the benches f and communicates with hoppers or collectors g placed under each polishing bob h in connection with the usual guards i; suitable supports being used for supporting and carrying the apparatus. The grit, particles, and dust fall against the guard into these hoppers from whence they are carried by the suction of the revolving turbine and fan or water wheel through the apparatus where the injurious particles and matter are deposited and the cleansed air taken out through the discharge pipe a^3 into the atmosphere.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

First. For ventilating, cleansing, disinfecting, and perfuming buildings, as

also for washing and cleansing smoke, the use of the apparatus as described in the specification and shown in detail in the drawings.

Second. In an apparatus for ventilating, cleansing, disinfecting, and perfuming buildings, as also for washing smoke, the combination with the chamber a of inlet and outlet pipes a^2 and a^3, the latter provided with disinfecting or perfuming means, outer pan or chamber b forming a water seal, horizontally-disposed turbine and fan c provided with pockets c^3, and water jets d provided with delivery nozzles d^2 for driving the turbine, substantially as described and set forth.

Third. In an apparatus for washing and cleansing smoke, the combination with the flue of a furnace of an extended inlet passage a^2 communicating with chamber a, horizontally-disposed turbine and fan c, water jets d for driving said turbine, water seal b for the carbon particles of the smoke to be collected, and outlet pipe a^3 for the cleansed air, substantially as described and set forth in Fig. 4 of the drawings.

Fourth. In an apparatus for purifying the atmosphere of workshops, the combination with the extended inlet pipe a^2 of the apparatus of hoppers or collectors g communicating therewith, encircling guards i for driving the grit and other particles into the hoppers, rotating turbine and fan c for sucking the dust and other particles through the inlet pipe a^2, outer pan b with water seal for receiving the said particles, and delivery pipe a^3 for taking away the cleansed air, substantially as shown in Figs, 5, 6. & 7 of the drawings.

Fifth. For ventilating, cleansing, disinfecting, and perfuming buildings, as also for washing and cleansing smoke, the general combination and arrangement of parts as shown and described.

Dated this 30th day of November 1903.

FRANK BIDDLE,
60, Newhall Street, Birmingham,
Agent for Applicant.

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FIG. 1.

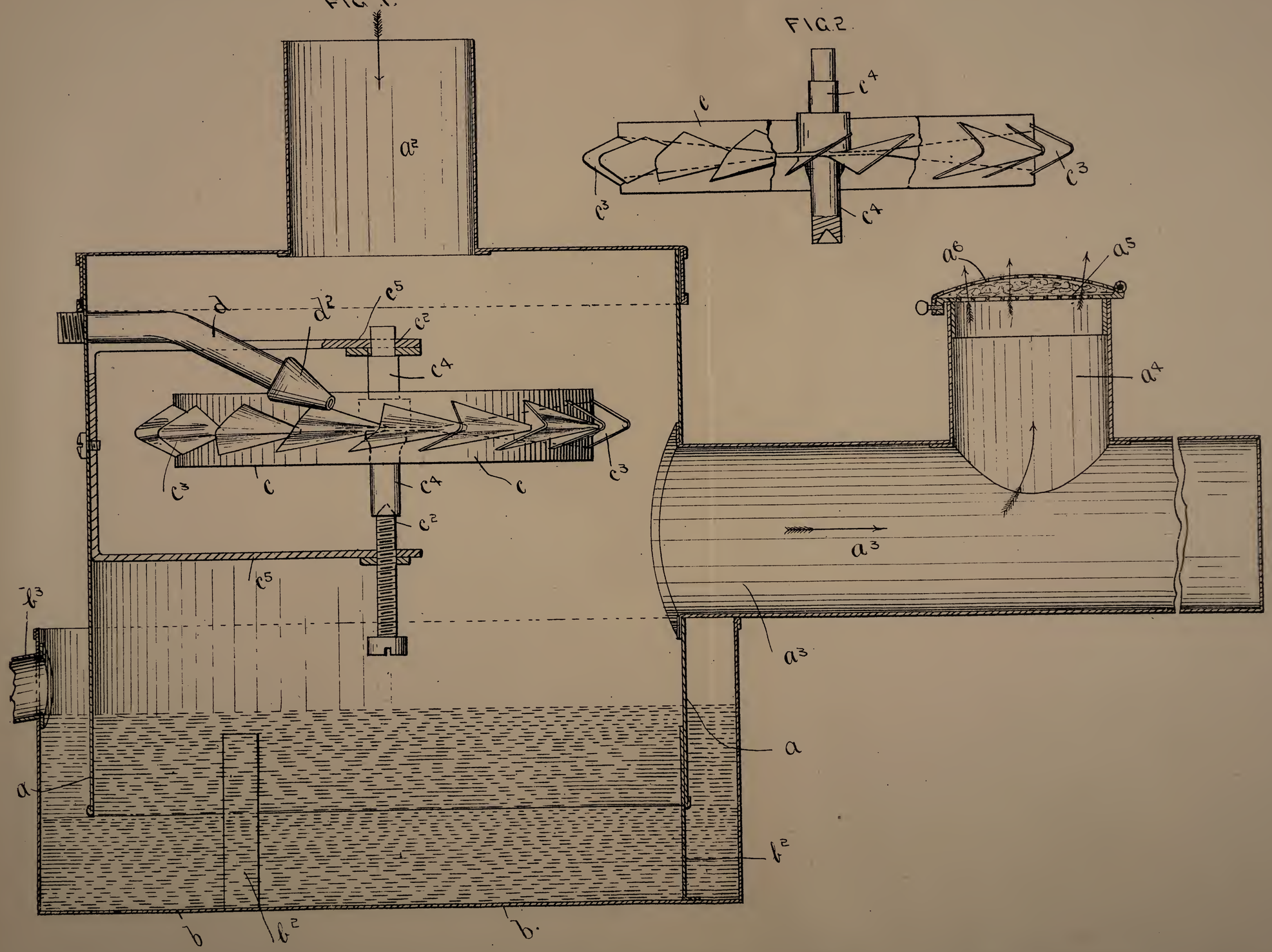

FIG. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]

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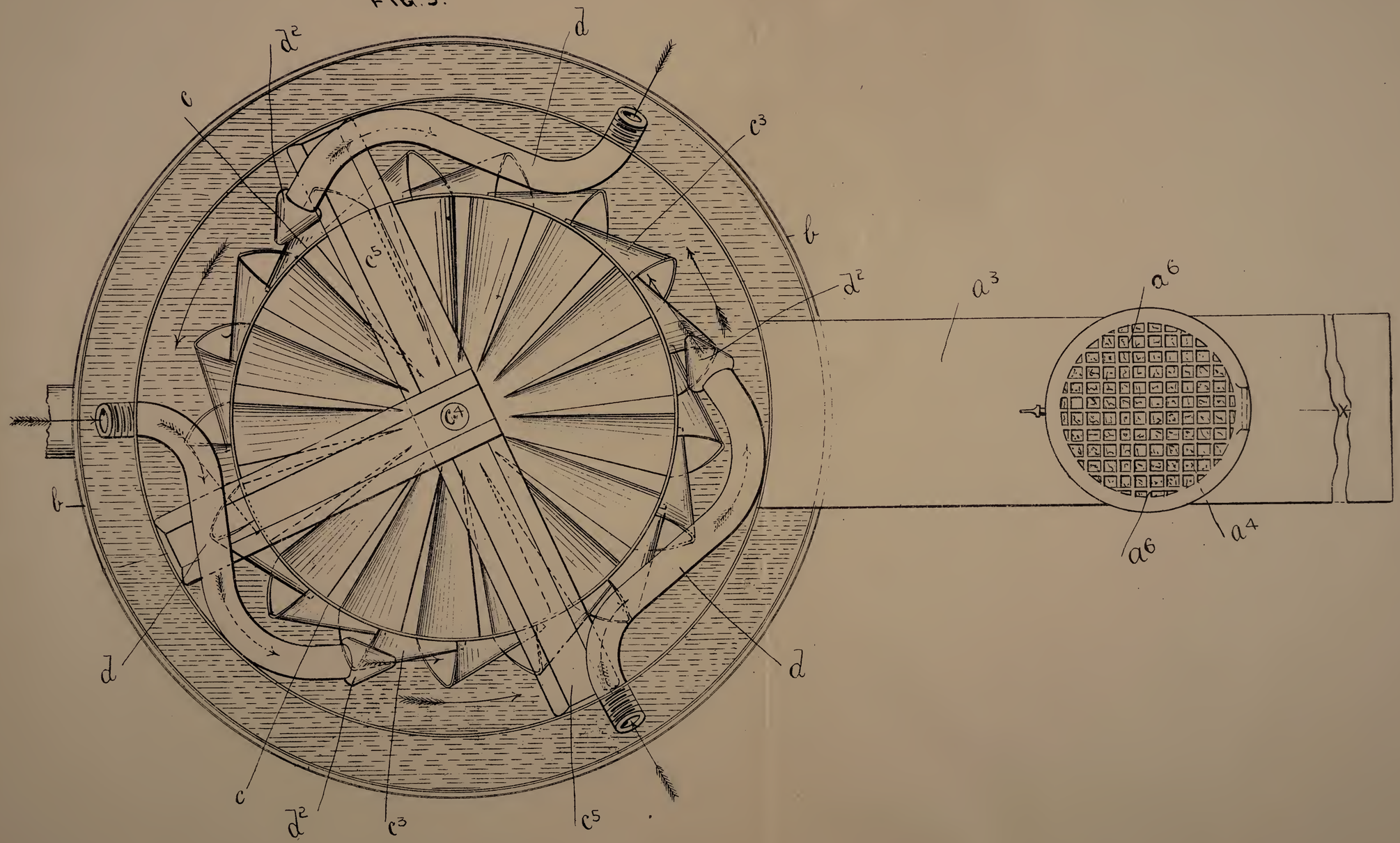
FIG. 3.



[This Drawing is a reproduction of the Original on a reduced scale]

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FIG 4.

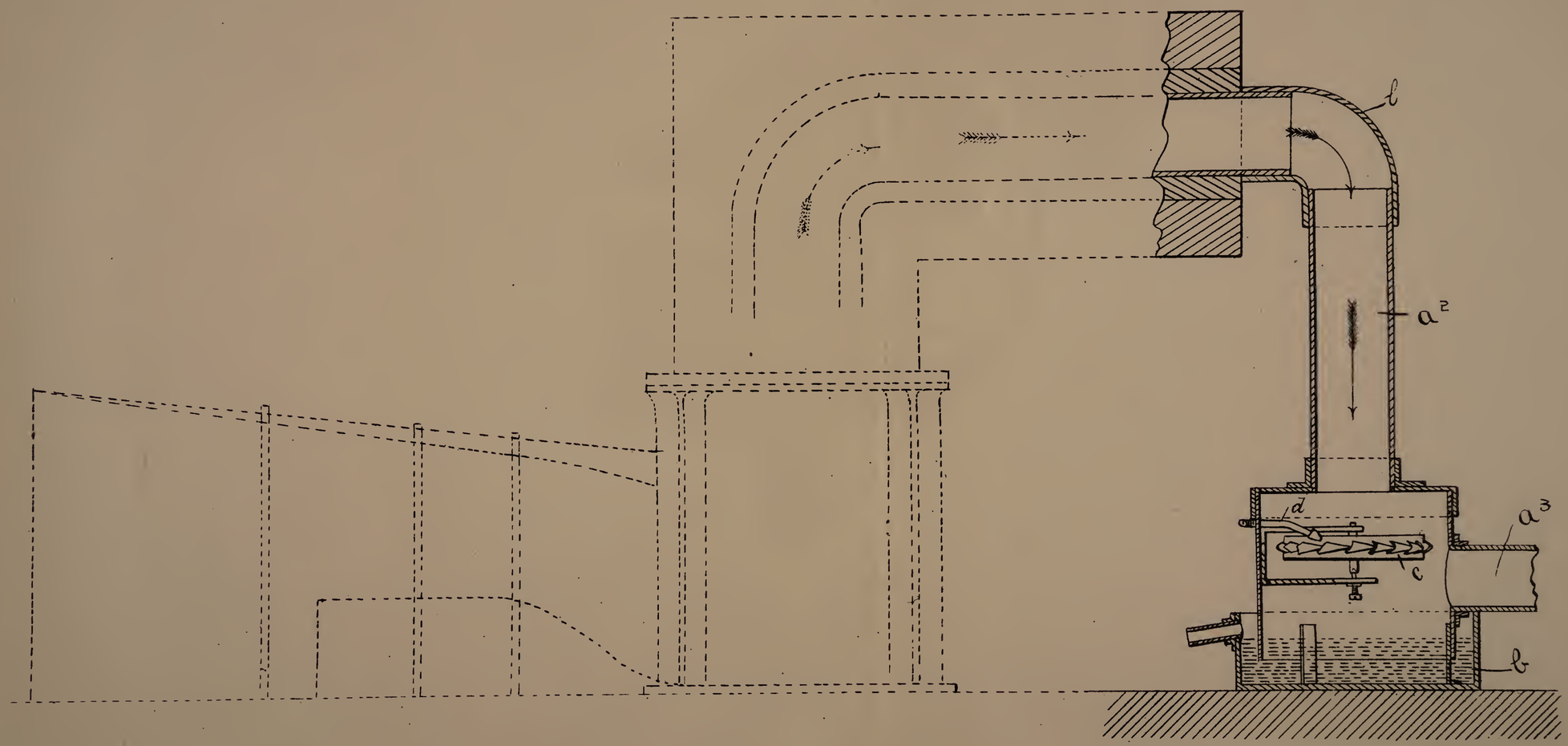

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FIG 5

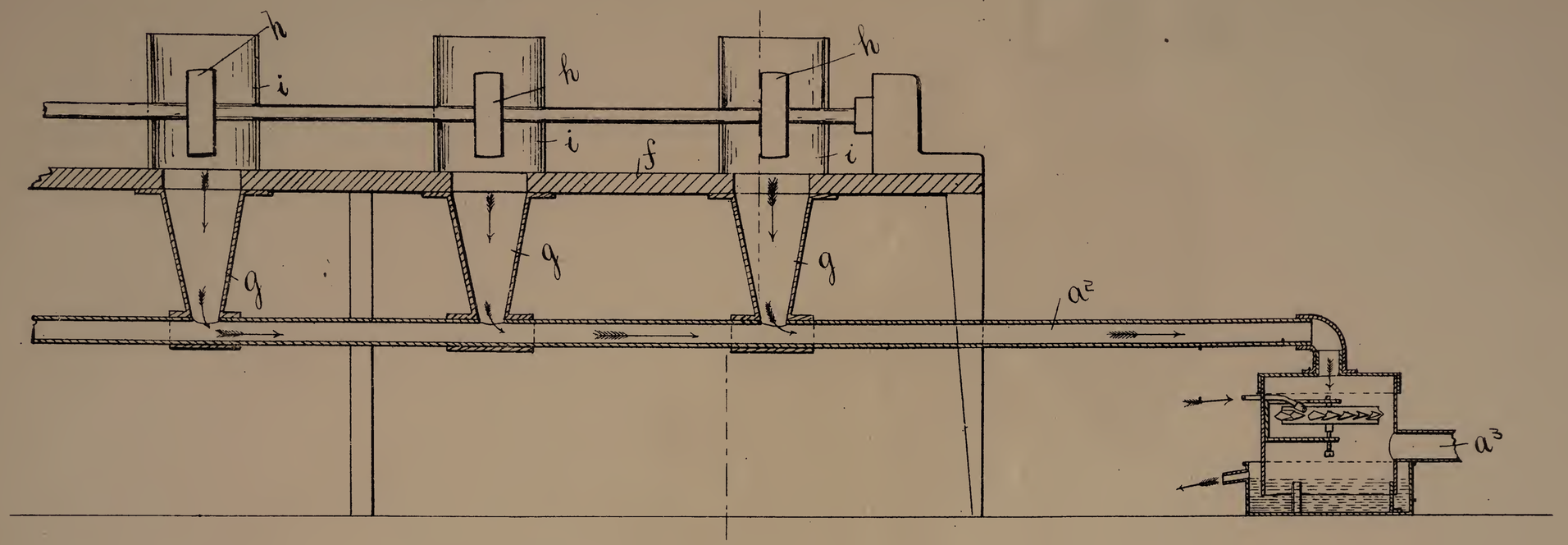


FIG 6

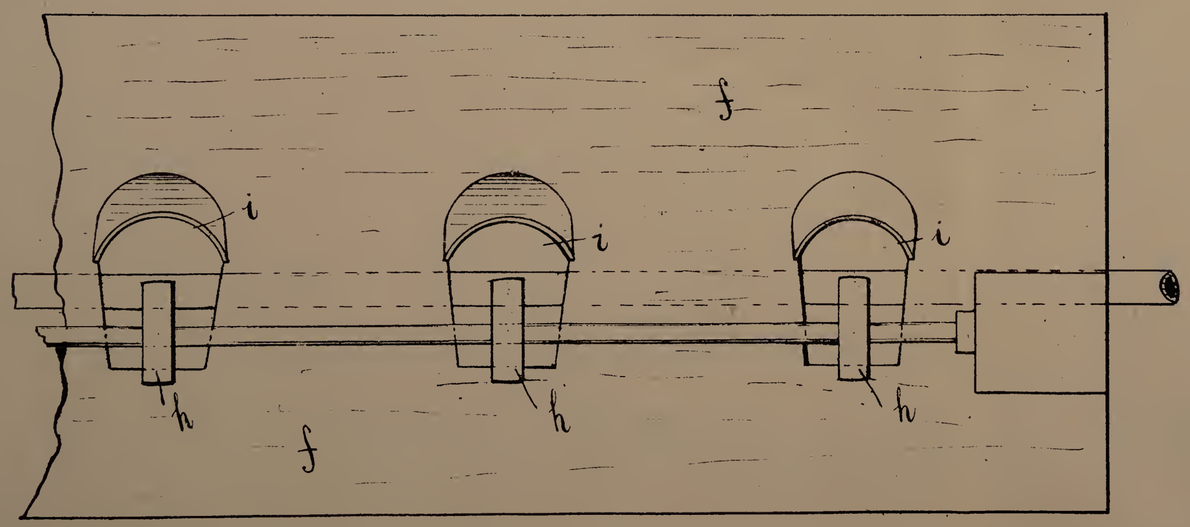
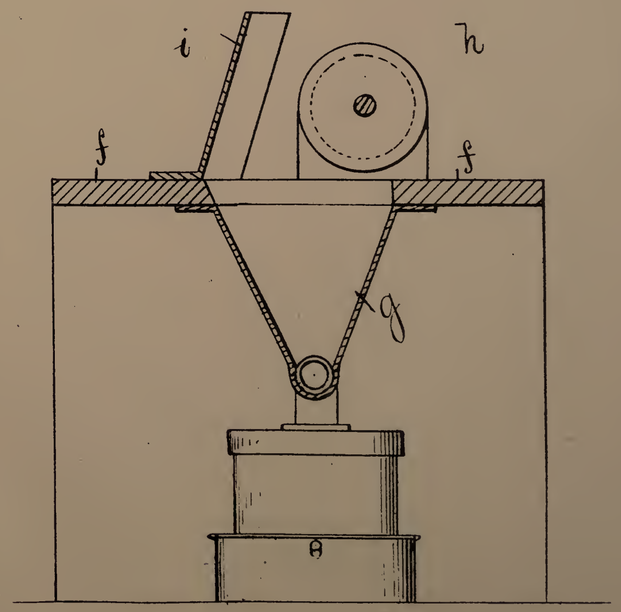


FIG 7.



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